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| 10/823,576 | 04/14/2004 | Yi-Kai Chen | 4444-0141PUS1 | 4813 |

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| EXAMINER | |
|---|---|
| ROBERTS, JESSICA M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2621 | |

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| 10/16/2007 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/823,576 | CHEN, YI-KAI | |
| | Examiner | Art Unit | |
| | Jessica Roberts | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,4,5,7 is/are rejected.

7)☒ Claim(s) 3,6 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 April 2004 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because in figure 2, complexity is spelled incorrectly. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

2. Claims 5-6 are objected to because of the following informalities:

Regarding claim 5 should depend upon claim 4.

Re claim 6, should depend upon claim 4.

For examination purposes, claims 5-6 are viewed as dependent upon claim 4.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 7 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 7, applicant has claimed a computer readable medium with a computer program stored therein, the computer program, when run on a computer...." Applicant has no support for this claim limitation in the specification or disclosure.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanamura et al., US-6, 587,508 and in view of Morita et al., US-6, 600,783.

8. Regarding claim 1, Hanamura teaches A rate controlling method for computing a reference quantization parameter (Hanamura, Virtual buffer fullness controlling unit combined with quantization parameter computing unit; column 21 line 46-51 and fig. 1:105-107. The virtual buffer fullness controlling unit and the quantization parameter computing unit is used to compute the reference quantization parameter Q(j) ), used in a transcoder having a variable length decoder (VLD, fig. 1: 51), an inverse quantizer (IQ, fig. 1:53), a quantizer (Q, fig. 1:55) and a variable length encoder (VLC, fig. 1:57), the rate controlling method comprising: receiving an input quantization parameter and motion information for each of the macroblocks from the variable length decoder (Hanamura; column 3 line 18-44 and fig. 13. Further it is inherent that the interframe contains motion information of the macroblock); compute a scaling factor for the current macroblock when allocated within P- and B-pictures (Hanamura, Hanamura discloses universal constants that are multiplied to the virtual buffer fullness for each picture type; column 21 line 35-45. Further, Hanamura discloses equations 40-42 that use universal

constants that are based on the type of picture i.e. P and B pictures). Hanamura discloses computing a bit difference between a target outputting bit stream and a real outputting bit stream from the variable length encoder (Hanamura, bit difference computing unit; column 8 line 33-39 and fig. 15: 67); estimating the fullness of a virtual buffer to encode the current macroblock in view of the scaling factor (Hanamura; the virtual buffer fullness controlling unit 105 is further designed to calculate a virtual buffer fullness. Further, Hanamura discloses Kp and Kb are universal constants dependent on the quantization matrices. Further, the value of the virtual buffer fullness is calculated by multiplying the constants with the initial value of the virtual buffer fullness; column 21 lines 10-65); and computing the reference parameter based on a target bit rate, the first quantization parameter and the bit difference (Hanamura, quantization parameter computing unit **71**. Hanamura discloses where the quantization parameter computing unit is electrically connected to the target output bit updating unit, and designed to compute the reference quantization parameter for each of macroblocks on the basis of the target outputting bits updated by the target output bit updating unit column 8 line 48-54. It should be noted that the target output bit updating unit feeds to the quantization parameter computing unit, which provides the target bit rate information (see fig. 15). Further, the quantization parameter (Q) is received by the VLC and further sent to the bit difference computing unit and then to the target output bit updating unit before the quantization parameter is calculated; which allows for the reference parameter to be computed based from both the bit difference computing unit, target output bit updating unit and the quantization parameter from the decoder);

Hanamura is silent in regards to analyzing the similarity of motion information between a current macroblock and its neighboring macroblocks to compute a scaling factor for the current macroblock when allocated within P- and B- pictures. However, Morita discloses motion vectors used for motion-compensated prediction are supplied to the ACTmv detector 25C for obtaining the absolute value ACTmv of the difference between vector components in macroblocks adjacent to each other. Further disclosed by Maorita is encoding input moving pictures with motion-compensated prediction. An average quantization scale factor of quantization scales factors used for quantizing the pictures of the input moving pictures (Morita, column 5 line 12-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Hanamura with the method of obtaining absolute value of the difference between vector components in macroblocks adjacent to each other for improving subjective picture quality for a moving picture sequence with the former part of simple scenes easy for encoding and the latter part of complex scenes hard for encoding (Morita, column 3 line 42-46).

Regarding claim 2, the combination of Hanamura and Morita as a whole further teaches wherein said motion information is a motion vector (Morita; column 6 line 53-59. Further, the examiner notes that since Hanamura discloses the use of the inter frame in the decoding scheme column 3 line 31-45; it is inherent that the interframe represent motion in the form of a motion vector).

Regarding claim 4, which is substantially the same as claim 1, therefore the rejection for claim 1 also applies for common subject matter.

Further regarding claim 4, Hanamura teaches a rate controller for computing a reference quantization parameter (Hanamura, Virtual buffer fullness controlling unit combined with quantization parameter computing unit; column 21 line 46-51 and fig. 1:105-107. The virtual buffer fullness controlling unit and the quantization parameter computing unit is used to compute the reference quantization parameter Q(j)), used in a transcoder having a variable length decoder (fig. 1: 51), an inverse quantizer (fig. 1:53), a quantizer(fig. 1:55) and a variable length encoder (fig. 1:57), the rate controller comprising: means for receiving an input quantization parameter and motion information for each of the macroblocks from the variable length decoder (Hanamura; column 3 line 18-44 and fig. 13. Further it is inherent that the interframe contains motion information of the macroblock); compute a scaling factor for the current macroblock when allocated within P- and B-pictures (Hanamura, Hanamura discloses universal constants that are multiplied to the virtual buffer fullness for each picture type; column 21 line 35-45. Further, Hanamura discloses equations 40-42 that use universal constants that are based on the type of picture i.e. P and B pictures); a remaining bit counting unit for computing a bit difference between a target outputting bit stream and a real outputting bit stream from the variable length encoder (Hanamura, column 19 line 41-54 and fig. 1); and a quantization parameter computing unit for estimating the fullness of a virtual buffer to encode the current macroblock in view of the scaling factor (Hanamura; the virtual buffer fullness controlling unit 105 is further designed to calculate a virtual buffer fullness. Further, Hanamura discloses Kp and Kb are universal constants dependent on the quantization matrices. Further, the value of the virtual buffer fullness is calculated by

multiplying the constants with the initial value of the virtual buffer fullness; column 21 lines 10-65), and computing the reference parameter based on a target bit rate, the first quantization parameter and the bit difference (Hanamura, quantization parameter computing unit **71**. Hanamura discloses where the quantization parameter computing unit is electrically connected to the target output bit updating unit, and designed to compute the reference quantization parameter for each of macroblocks on the basis of the target outputting bits updated by the target output bit updating unit column 8 line 48-54. It should be noted that the target output bit updating unit feeds to the quantization parameter computing unit, which provides the target bit rate information (see fig. 15). Further, the quantization parameter (Q) is received by the VLC and further sent to the bit difference computing unit and then to the target output bit updating unit before the quantization parameter is calculated; which allows for the reference parameter to be computed based from both the bit difference computing unit, target output bit updating unit and the quantization parameter from the decoder).

Hanamura is silent in regards to analyzing the similarity of motion information between a current macroblock and its neighboring macroblocks to compute a scaling factor for the current macroblock when allocated within P- and B- pictures. However, Morita discloses motion vectors used for motion-compensated prediction are supplied to the ACTmv detector 25C for obtaining the absolute value ACTmv of the difference between vector components in macroblocks adjacent to each other. Further disclosed by Maorita is encoding input moving pictures with motion-compensated prediction. An average quantization scale factor of quantization scales factors used for quantizing the

pictures of the input moving pictures (Morita, column 5 line 12-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Hanamura with the method of obtaining absolute value of the difference between vector components in macroblocks adjacent to each other for improving subjective picture quality for a moving picture sequence with the former part of simple scenes easy for encoding and the latter part of complex scenes hard for encoding (Morita, column 3 line 42-46).

Regarding claim 5 the combination of Hanamura and Morita as a whole further teaches wherein said motion information is a motion vector (Morita; column 6 line 53-59. Further, the examiner notes that since Hanamura discloses the use of the inter frame in the decoding scheme column 3 line 31-45; it is inherent that the interframe represent motion in the form of a motion vector).

a motion analyzer for analyzing the similarity of motion information between a current macroblock and its neighboring macroblocks to

Regarding claim 7, the rejection and analysis made in claims 1 also apply here. The combination of Hanamuara and Morita as a whole further teaches a processor based system. Hence a computer program stored on a computer readable medium for executing the necessary steps corresponding to the method of claim 1 would have been obvious.

***Allowable Subject Matter***

9. Claims 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The present invention as claimed involves a rate controlling method and apparatus for computing a reference parameter for use in a transcoder. The novel features include the scaling factor dependent upon the motion determined from neighboring macroblocks, where the scaling factor is defined as d factor = 1 + sign ( MV ( j ) MV median ) · ( MV ( j ) MV median ) / ( MV ( j ) MV median ).

11. The prior art of record fails to anticipate or render obviousness the limitations of the claimed invention where the scaling factor is defined as the following: d factor = 1 + sign ( MV ( j ) MV median ) · ( MV ( j ) MV median ) / ( MV ( j ) MV median ) sign ( a ) = { 1 if a 0 - 1 if a < 0 where "·" is operator for inner product, MV is the motion vector of the current macroblock, and MV.sub.median is the median of the motion vectors of its neighboring macroblocks.

***Conclusion***

12. The referenced citations made in the rejection(s) above are intended to exemplify areas in the prior art document(s) in which the examiner believed are the most relevant to the claimed subject matter. However, it is incumbent upon the applicant to analyze the prior art document(s) in its/their entirety since other areas of the document(s) may be relied upon at a later time to substantiate examiner's rationale of record. A prior art

reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). However, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." In re Fulton, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim et al., US-7,266,148 – Video transcoding apparatus.

Xia et al., US-6,014,466; -- Object based video coding of arbitrarily shaped objects using lapped orthogonal transforms defined on rectangular and L shaped regions.

Holcomb et al., US-2005/0111547A1 – Signaling reference frame distances.

Mukerjee et al., US-2005/0053298A1 –Four motion vector coding and decoding in bi-directionally predicted interlaced pictures.

Eleftheriadis et al., US-6,055,330 –Methods and apparatus for performing digital image and video segmentation and compression using 3-D depth information.

Wang et al., US-2003/0215011A1 – Method and apparatus for transcoding compressed video bitstreams.

Fogg et al., US-6, 466,624 B1 – Video decoder with bit stream based enhancements.

Kobayashi et al., US-6,825,886 B2 – Picture signal processing method and apparatus.

Kobayashi et al., US-2002/0141503 A1 – Picture signal processing method and apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica Roberts whose telephone number is (571) 270-1821. The examiner can normally be reached on 7:30-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jessica M. Roberts/
09-12-2007

Mehrdad Dastouri
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TC 2600